

IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

1. (Withdrawn) An amplification system employing Raman amplification with a plurality of first-order Raman pumps and at least one second-order Raman pump which amplifies the first-order Raman pumps, the first- and second-order pumps counter-propagating to signal light in an optical fiber, the amplification system comprising:

a plurality of light sources generating pump light of the first- and second-order pumps;
and

a modulator unit modulating the pump light of the first- and second-order pumps by using relative timing of the first- and second-order pumps to optimize lateral signal power distribution along the optical fiber.

2. (Currently Amended) An amplification system employing Raman amplification with a plurality of first-order Raman pumps and at least one second-order Raman pump which amplifies the first-order Raman pumps, the first- and second-order Raman pumps counter-propagating to signal light in an optical fiber, the amplification system comprising:

a plurality of light sources generating pump light of the first- and second-order pumps;
and

a modulator unit modulating the pump light of the first- and second-order pumps by using a relative-first timing between-for the pump light of the first-order pumps and a second timing relatively different from the first timing for the pump light of the at least one second-order pump to allow flattening lateral signal power distribution along the optical fiber.

3. (Original) The amplification system according to claim 2, further comprising a light source generating pump light of at least one third-order pump co-propagating with the signal light to amplify the second-order pump.

4. (Original) The amplification system according to claim 2, further comprising a

light source generating pump light of at least one third-order pump co-propagating with the second-order pump to amplify the second-order pump.

5. (Original) The amplification system according to claim 2, wherein the modulator unit controls a temporal shape of modulated pulses of the second-order pump such that pump power of the modulated pulses of the second-order pump overlap with pump power of modulated pulses of the first-order pumps.

6. (Original) The amplification system according to claim 5, wherein the modulator unit controls the temporal shape of the pulses such that power transfer from the second-order pump to the first-order pumps is pushed deeper into the optical fiber.

7. (Currently Amended) The amplification system according to claim 2, wherein the modulator unit includes driver electronics controlling the ~~relative~~first and the second timing and electrically modulates the pump light of the first- and second-order pumps through the driver electronics.

8. (Currently Amended) The amplification system according to claim 2, wherein the modulator unit includes optical modulators controlling the ~~relative~~first and the second timing and optically modulates the pump light of the first- and second-order pumps through the optical modulators.

9. (Cancelled).

10. (Withdrawn) An amplification system employing Raman amplification with a plurality of first-order Raman pumps and at least one second-order Raman pump which amplifies the first-order Raman pumps, the first- and second-order pumps counter-propagating to signal light in an optical fiber, the amplification system comprising:

a plurality of light sources generating pump light of the first- and second-order pumps;
and

a modulator unit modulating the pump light of the first- and second-order pumps by controlling a length of an interaction area in the optical fiber, in which pump power of modulated pulses of the second-order pump overlap with pump power of modulated pulses of the first-order pumps.

11. (Withdrawn) The amplification system according to claim 10, wherein the modulator unit controls the length of the interaction area by adjusting at least one of modulation frequencies, duty cycles and temporal offsets of pulses of the first- and second-order pumps.

12. (Withdrawn) An amplification method employing Raman amplification with a plurality of first-order Raman pumps and at least one second-order Raman pump which amplifies the first-order Raman pumps, the first- and second-order pumps counter-propagating to signal light in an optical fiber, the amplification method comprising:

generating pump light of the first- and second-order pumps;

modulating the pump light of the first- and second-order pumps by using relative timing of the first- and second-order pumps to optimize lateral signal power distribution along the optical fiber; and

launching the first- and second-order pumps in opposite direction to the signal light in the optical fiber.

13. (Currently Amended) An amplification method employing Raman amplification with a plurality of first-order Raman pumps and at least one second-order Raman pump which amplifies the first-order Raman pumps, the first- and second-order Raman pumps counter-propagating to signal light in an optical fiber, the amplification method comprising:

generating pump light of the first- and second-order Raman pumps;

modulating the pump light of the first- and second-order Raman pumps by using a relative-first timing between-for the pump light of the first-order pumps and a second timing different from the first timing for the light pumped of the at least one second-order pump to allow flattening lateral signal power distribution along the optical fiber; and

launching the pump light of the first- and second-order pumps in opposite direction to the signal light in the optical fiber.

14. (Cancelled).

15. (Currently Amended) A Raman amplification method in an optical fiber, comprising:

emitting pump light of a plurality of first-order Raman pumps and at least one second-order Raman pump, with a first-order pump lights having different time offset between the pump

light of the first-order Raman ~~pumps~~pump and the pump light of the at least one second-order Raman pump, and different launching powers correlated to equalize a gain induced by the plurality of first order pumps along the fiber.